Date of Issue:
12 August 2015

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 1886b
SRM Name: White Portland Cement
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended primarily for use in evaluating chemical methods of analysis and in the calibration of instrumental methods for analysis of cements and materials of similar matrix. A unit of SRM 1886b consists of five sealed vials, each containing approximately 5 g of portland cement ground to pass a 75 µm (No. 200) sieve and each sealed in a foil pouch.

Company Information

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2. Hazards Identification

Classification

Physical Hazard:	Not classified.	
Health Hazard:	Skin Corrosion/Irritant	Category 1
	Eye Damage and Irritant	Category 1
	Skin Sensitization	Category 1
	Carcinogenicity	Category 1A
	STOT, Single Exposure	Category 3
	STOT, Repeated Exposure	Category 1

Label Elements

Symbol

Signal Word
DANGER

Hazard Statement(s)

H314	Causes severe skin burns and serious eye damage.
H317	May cause allergic skin reaction.
H350	May cause cancer.
H335	May cause respiratory irritation.
H372	Causes damage to organs through prolonged or repeated inhalation exposure.

Precautionary Statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash hands and exposed areas thoroughly after handling.

P270	Do not eat, drink, or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing must not be allowed out of the work place.
P280	Wear protective gloves, protective clothing, and eye protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340	If inhaled: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contacts lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a doctor.
P333+P313	If skin irritation or rash occurs: Get medical attention.
P308+P313	If exposed or concerned: Get medical attention.
P363	Wash contaminated clothing before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. Composition and Information on Hazardous Ingredients

Substance: Portland Cement

Other Designations: Hydraulic cement; cement (portland); silicate, portland cement; portland cement silicate.

Components are listed in compliance with OSHA's 29 CFR 1910.1200. Cement may also contain trace amounts of oxides and other chemicals due to the starting minerals and manufacturing process, including chromium compounds. The concentration ranges for the components are listed as provided by the manufacturer to protect proprietary information. The forms listed below may differ from the constituents listed in the NIST Certificate of Analysis, which are expressed as the chemical forms and in the order given in ASTM C114-10.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Cement, portland, chemicals	65997-15-1	266-043-4	100
Calcium oxide	1305-78-8	215-138-9	A to B
Quartz	14808-60-7	238-878-4	C to D
Hexavalent chromium	18450-29-9	not available	E to F
Gypsum ($CaSo_4 \cdot 2H_2O$)	13397-24-5	603-783-2	G to H
Limestone	1317-65-3	215-279-6	I to J
Magnesium oxide	1309-48-4	215-171-9	K to L

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

Skin Contact: Rinse affected skin with water for at least 15 minutes, and then wash thoroughly with soap or mild detergent and water. If skin irritation persists, seek medical aid and bring the container or label.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

Ingestion: If a large amount is swallowed, seek medical attention.

Most Important Symptoms/Effects, Acute, and Delayed: Prolonged exposure to wet or dry cement on moist areas of the body can cause burns to skin or respiratory tract and eye damage. Prolonged exposure respirable silica particles can cause lung damage (silicosis) and cancer.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing agents appropriate to surrounding fire (regular dry chemical, carbon dioxide, water, or regular foam).

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Not applicable.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 3 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Avoid generating dust. Collect in appropriate container for disposal.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handle in accordance with all current regulations and standards. Keep glass vial in labeled foil pouch when not in use. The certificate of analysis contains additional storage directions to ensure validity of the certified values. Keep separated from incompatible substances (See Section 10, "Stability and Reactivity").

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits			
Components	**OSHA (PEL)**	**ACGIH (TLV)**	**NIOSH (REL)**
Portland Cement	TWA: 15 mg/m^3 (total dust) TWA: 5 mg/m^3 (respirable fraction) TWA: 50 mppcf (<1 % crystalline silica)	TWA: 1 mg/m^3 (respirable fraction, particulate matter containing no asbestos and <1 % crystalline silica)	TWA: 10 mg/m^3 (total dust) TWA: 5 mg/m^3 (respirable dust) IDLH: 5000 mg/m^3
Calcium oxide	TWA: 5 mg/m^3	TWA: 2 mg/m^3	TWA: 2 mg/m^3
Calcium carbonate (limestone)	TWA: 15 mg/m^3 (total dust) TWA: 5 mg/m^3 (respirable fraction)	No occupational exposure limits established.	TWA: 10 mg/m^3 (total dust) TWA: 5 mg/m^3 (respirable dust)
Magnesium oxide	TWA: 15 mg/m^3 (total dust)	TWA: 10 mg/m^3 (inhalable fraction)	No occupational exposure limits established.
Calcium Sulfate (Gypsum)	TWA: 15 mg/m^3 (total dust) TWA: 5 mg/m^3 (respirable fraction)	TWA: 10 mg/m^3 (inhalable fraction)	TWA: 10 mg/m^3 (total dust) TWA: 5 mg/m^3 (respirable dust)
Silica, crystalline quartz	TWA: 30/(SiO_2 + 2) mg/m^3 (total dust) TWA: 10/(SiO_2 +2) mg/m^3 (respirable fraction) TWA: 250/(SiO_2 + 5) mppcf (respirable fraction)	TWA: 0.025 mg/m^3 (respirable fraction)	TWA: 0.05 mg/m^3 (respirable dust) IDLH: 50 mg/m^3 (respirable dust)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye Protection: Splash resistant safety goggles and emergency eyewash are recommended.

Skin and Body Protection: Chemical resistant clothing and gloves are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:	Portland Cement
Appearance (physical state, color, etc.)	Solid, grey or white powder
Molecular Formula	not available
Molar Mass (g/mol)	not available
Odor	none
Odor threshold	not available
pH	12 to 13
Evaporation rate	not available
Melting point/freezing point	not available
Relative Density (as specific gravity water = 1)	2.3 to 3.1
Vapor Pressure	not available
Vapor Density (air = 1)	not available
Viscosity (cP)	none (solid)
Solubility(ies)	water: slightly soluble (0.1 % to 1.0 %)
Partition coefficient (n-octanol/water)	not available
Thermal Stability Properties	
Autoignition Temperature	not available
Thermal Decomposition	not available
Initial boiling point and boiling range	>1000 °C (1832 °F)
Explosive Limits, LEL (Volume %)	not available
Explosive Limits, UEL (Volume %)	not available
Flash Point	not available
Flammability (solid, gas)	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Contact with combustible or incompatible materials. Avoid generating dust. Keep dry until use.

Incompatible Materials: Wet cement is alkaline and is incompatible with acids, ammonium salts, and aluminum metal.

Hazardous Decomposition: Miscellaneous decomposition products.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Eye damage, skin irritation, and skin sensitization. May damage mucous membranes. May aggravate respiratory disorders.

Potential Health Effects (Acute, Chronic, and Delayed):

Inhalation: Irritation, cough phlegm. Prolonged or repeated exposure to mixed cement dusts may cause cough, expectoration, dyspnea, wheezing, pharyngitis, chronic bronchitis, emphysema, cement pneumoconiosis, and silicosis.

Skin Contact: Irritation (possibly severe) and dermatitis. Direct content with wet cement, combined with prolonged contact time and pressure may cause ulcerations and possibly burns. Sensitivity to constituents of cement may induce allergic skin reactions (chromium compounds).

Eye Contact: Irritation, visual disturbances, eye damage. In addition, wet cement may cause a burning sensation, corneal edema indicated by seeing halos around lights, and injury to the conjunctiva.

Ingestion: Irritation (long-term) and possible gastroduodenal ulcers.

Numerical Measures of Toxicity:

Acute toxicity: Not classified.
Portland cement: No data available.

Skin corrosion/irritation: Category 1, Corrosive.
Exposure may cause irritation (rash, scaling, and cracking) and dermatitis. May cause burns in the presence of moisture.

Serious eye damage/eye irritation: Category 1, Eye damage.
Exposure to portland cement dust may cause severe eye damage and burns in the presence of moisture.

Respiratory sensitization: No data available.

Skin sensitization: Skin sensitization, Category 1.
Portland cement may contain trace amounts of hexavalent chromium which may cause allergic skin reactions.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Category 1A.

Listed as a Carcinogen/Potential Carcinogen X **Yes** _____ **No**

Portland cement, calcium oxide, gypsum, calcium carbonate, and magnesium oxide are not listed by OSHA, IARC, or NTP as a carcinogen or potential carcinogen.

Ferric oxide is listed as Group 3, *not classifiable* by IARC, and is not listed by NTP or OSHA as a carcinogen or potential carcinogen.

Silica, crystalline quartz is listed as Group 1, *carcinogenic to humans* by IARC, *known human carcinogen* (respirable size) by NTP, and is not listed by OSHA as a designated carcinogen.
Tumorigenic data: Rat, Inhalation, TCLo: 50 mg/m^3 (6 h)
Mutagenic data: Human, 120 mg/L (24 h)

Reproductive Toxicity: No data available.

Specific Target Organ Toxicity, Single Exposure: Category 3, Respiratory tract irritation.
May cause respiratory irritation.

Specific Target Organ Toxicity, Repeated Exposure: Category 1, Lungs.
Repeated and prolonged exposure to portland cement and respirable quartz may cause chronic bronchitis, emphysema, cement pneumoconiosis, and silicosis.

Aspiration Hazard: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data
Calcium oxide: Chronic, NOEC 100 mg/L, fresh water; Nile tilapia (*Oreochromis niloticus*) – juvenile (46 d).

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT and IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Not regulated.
OSHA Process Safety (29 CFR 1910.119): Not regulated.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations

California Proposition 65: Warning! This product contains a chemical (quartz) known to the state of California to cause cancer. This product also contains trace metals (chromium) known to the state of California to cause cancer and reproductive effects.

U.S. TSCA Inventory: Portland cement, crystalline quartz, calcium oxide, calcium carbonate, and magnesium oxide are listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 12 August 2015

Sources: ChemAdvisor, Inc., SDS *Portland Cement*, 20 March 2015.

Vendor SDS, Leigh White Cement, *Portland Cement*, 21 May 2015.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	STOT	Specific Target Organ Toxicity
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
NFPA	National Fire Protection Association	TSCA	Toxic Substances Control Act
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
n.o.s.	Not Otherwise Specified	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.